

Notice of Allowability

Application No.

09/759,054

Applicant(s)

KALMAN ET AL.

Examiner

Art Unit

Gary L. Laxton

2838

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to the amendment filed 07/26/04.
2. ☒ The allowed claim(s) is/are 1-4,9,10,12-14 and 18-21.
3. ☒ The drawings filed on 10 January 2001 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some* c) ☐ None of the:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
- (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
- (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|---|---|
| 1. <input type="checkbox"/> Notice of References Cited (PTO-892) | 5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 6. <input type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date _____ |
| 3. <input type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date _____ | 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| | 9. <input type="checkbox"/> Other _____ |

G-L Laxton
GARY L. LAXTON 8/23/04

DETAILED ACTION

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

The application has been amended as follows:

In claim 2 line 23 please change "secondPark" to – second Park –.

Allowable Subject Matter

2. Claims 1-4, 9, 10, 12-14, 18-21 are allowed.

3. The following is an examiner's statement of reasons for allowance:

Concerning claims 1, 9, 10 and 12; prior art fails to disclose or suggest, inter alia, an apparatus for power conversion having a controller to generate a rotor position vector, compute a motor current Park vector that is synchronous with an emf Park vector, PI regulates an imaginary portion of the synchronous motor current Park vector, then uses the regulated imaginary portion to shift the position signal and then uses the shifted signal to drive the drive side inverter switches.

Claims 2-4; prior art fails to disclose or suggest, inter alia, a power conversion apparatus having a source-side inverter terminated in an ac capacitor bank; wherein a controller uses a

phase angle of a current Park vector to command the source-side inverter switches to connect selected phases of the capacitor bank to the dc current link and maintain a relatively ripple-free current on the dc link and wherein the controller also performs damping during each second portion of the modulation cycle through modification of the phase angle by computing a Park vector of capacitor bank voltage, computing a second Park vector representing resonant frequencies of the voltage Park vector, regulating the second Park vector, and using it to correct the phase angle.

Claims 13, 14, 18 and 19; prior art fails to disclose or suggest, inter alia, a controller using phase angle of the current Park vector to switch the first inverter switches to connect selected phase of the capacitor bank to the dc current link, and performing damping during each second portion of the modulating cycle through modification of the phase angle by computing a Park vector of capacitor bank voltage, computing a second vector representing resonant frequencies of the voltage Park vector regulating the second vector, and using the regulated vector to correct the phase angle.

Claim 20; prior art fails to disclose or suggest, inter alia, a controller generates a vector indicating back emf computes a current Park vector that is synchronous with respect to the back emf vector, PI-regulates an imaginary portion of the synchronous current Park vector, and uses the regulated imaginary portion to select switches of the second inverter.

Claim 21; prior art fails to disclose or suggest, inter alia, an apparatus having position sensors for generating a position signal indicating position of a motor emf Park vector, generating a rotor position unit vector from the position signal, compute a motor current Park vector that is synchronous with an emf Park vector, PI regulates an imaginary portion of the


synchronous motor current Park vector, then uses the regulated imaginary portion to shift the position signal and then uses the shifted signal to drive the switches of the second inverter.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gary L. Laxton whose telephone number is (571) 272-2079. The examiner can normally be reached on Monday thru Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Sherry can be reached on (571) 272-2084. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Gary L. Laxton
Patent Examiner
Art Unit 2838

8/23/04